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Total Number of Pages in This Submission: 30

Application Number	09/016,002
Filing Date	January 30, 1998
First Named Inventor	LAMPERT
Art Unit	3624
Examiner Name	ELLA COLBERT
Attorney Docket Number	7117-89

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Firm Name	Frank J. Kozak, NAVTEQ North America, LLC		
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Date	October 30, 2006	Reg. No.	32,908

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PATENT
Case No. 7117-89

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: LAMPERT et al.	)	
Serial No. 09/016,002	)	Group Art Unit: 3624
Title: PARCELIZED GEOGRAPHIC DATA MEDIUM WITH INTERNAL SPATIAL INDICES AND METHOD AND SYSTEM FOR USE AND FORMATION THEREOF	)	Examiner: ELLA COLBERT
Filed: January 30, 1998	)	

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Respectfully submitted,

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PATENT & TRADEMARK OFFICE

PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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APPEAL BRIEF

This appeal brief is submitted pursuant to 37 CFR 41.37. This is an appeal of the final Office Action dated May 26, 2006. A Notice of Appeal was timely filed on August 28, 2006.

(i) REAL PARTY IN INTEREST

The real party in interest is NAVTEQ North America, LLC (formerly named Navigation Technologies Corporation), a publicly-traded corporation that has its headquarters in Chicago, Illinois.

(ii) RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

(iii) STATUS OF CLAIMS

Claims 1, 11, 12, 16, 18, 21, 22 and 27 have been canceled.

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Claims 2-10, 13-15, 17, 19, 20, 23-26, 28 and 29 are pending.

Claims 2-10, 17, 19, 23, 26 and 28 have been allowed.

Claims 13-15 were rejected as obvious over the combination of U.S. Pat. No. 5,754,846 ("Janse"), U.S. Pat. No. 5,694,534 ("White Jr."), U.S. Pat. No. 6,282,489 ("Bellesfield"), and U.S. Pat. No. 5,968,109 ("Israni").

Claims 20 and 29 were rejected as obvious over the combination of Israni and White Jr.

Claim 24 was rejected as obvious over the combination of Bellesfield, Janse and White Jr.

Claim 25 was rejected as obvious over the combination of Janse, White Jr. and Bellesfield.

Claims 13-15, 20, 24, 25 and 29 have been appealed.

(iv) STATUS OF AMENDMENTS

There has been no amendment filed subsequent to the final rejection.

(v) SUMMARY OF CLAIMED SUBJECT MATTER

Appellant's independent Claim 24 relates to a *"computer-implemented method of using a geographic database"* (530 in FIG. 12; page 33, lines 6-9). Appellant's Claim 24 includes the step of *"accepting specification of a search area"* (400 in FIG. 11; page 33, line 15-page 34, line 19) relating to a *"geographic region"* (12 in FIG. 1) represented by the *"geographic database"* (530 in FIG. 12). Next, Appellant's Claim 24 includes the step of *"identifying"* (page 34, lines 20-22; page 35, lines 5-6) a *"parcel"* (516 in FIG.

12) of data in the *"geographic database"* (530 in FIG. 12), wherein the *"parcel"* (516 in FIG. 12) contains *"data entities"* (22 in FIG. 12) that represent *"geographic features"* (22(1)-22(n) in FIGS. 2 and 7) encompassed within a *"first rectangular area"* (204 in FIG. 6; 302 in FIG. 7; page 30, lines 9-13) located within the *"geographic region"* (12 in FIG. 1), wherein the *"first rectangular area"* (204 in FIG. 6) intersects the *"search area"* (400 in FIG. 11; page 35, lines 5-6). Appellant's Claim 24 further includes the step of *"using a first index"* (322 in FIG. 9) associated with the *"parcel"* (516 in FIG. 12) to identify which of a *"plurality of rectangular sub-areas"* (307(0)-308(7) in FIG. 11) into which the *"first rectangular area"* (300 in FIG. 11; 6; 302 in FIG. 7; page 30, lines 9-13) is divided intersect the *"search area"* (400 in FIG. 11; page 35, lines 21-23). Then, Appellant's Claim 24 includes the step of *"using a second index"* (320 in FIGS. 10 and 12; page 35, lines 30-32) associated with the *"parcel"* (516 in FIG. 12) to identify the *"data entities"* (seg(1)-seg(n) in FIG. 10) contained in the *"parcel"* (516 in FIG. 12) that represent the *"geographic features"* (22(1)-22(n) in FIGS. 2 and 7) that intersect each of the *"plurality of rectangular sub-areas"* (307(0)-308(7) in FIG. 11) identified as intersecting the *"search area"* (400 in FIG. 11; page 35, lines 30-32). Appellant's Claim 24 states that where the *"search area"* (400 in FIG. 11) intersects more than one of the *"plurality of rectangular sub-areas"* (307(0)-308(7) in FIG. 11) and a *"geographic feature"* (22(e) in FIG. 7) represented by a *"single data entity"* (seg(e) in FIG. 10) intersects each of the *"plurality of rectangular sub-areas"* ((0), (2), (3), (7) in FIG. 10), the *"second index"* (320 in FIG. 12) identifies the *"single data entity"* (seg(e) in FIG. 10), thereby enabling the *"data entities"* (seg(1), seg(2), seg(e), seg(g) in FIG. 10) that

represent the *"geographic features"* (22(1)-22(n) in FIGS. 2 and 7) located within the *"search area"* (400 in FIG. 11) to be determined.

Appellant's independent Claim 25 relates to a *"computer-implemented method of using a geographic database"* (530 in FIG. 12; page 33, lines 6-9) to identify *"geographic features located within a search area"* (400 in FIG. 11; page 33, lines 15-page 34, line 5-19). According to Appellant's Claim 25, the *"geographic database"* (530 in FIG. 12) contains *"data entities"* (22 in FIG. 12) that represent *"geographic features"* (22(1)-22(n) in FIGS. 2 and 7) located in a *"geographic region"* (12 in FIG. 1). Further according to Appellant's Claim 25, the *"geographic database"* (530 in FIG. 12) is organized into *"parcels"* (516 in FIG. 12), each of which contains a subset of all the *"data entities"* (22 in FIG. 12) in the *"geographic database"* (530 in FIG. 12). Appellant's Claim 25 states that the subset of *"data entities"* (22 in FIG. 12) in each *"parcel"* (516 in FIG. 12) represent the *"geographic features"* (14 in FIG. 1) encompassed within a separate respective one of a plurality of *"rectangular areas"* (204 in FIG. 6; 302 in FIG. 7) into which the *"geographic region"* (12 in FIG. 1) is divided (page 30, lines 3-21). Appellant's Claim 24 further includes the step *"identifying"* (page 34, lines 20-22; page 35, lines 5-6) each *"parcel"* (516 in FIG. 12) that is associated with a *"rectangular area"* (204 in FIG. 6; 302 in FIG. 7) that intersects the *"search area"* (400 in FIG. 11; page 33, line 32-page 34 line 3; page 34, lines 11-23). Next, Appellant's Claim 25 calls for the step of *"using a first index"* (322 in FIG. 9) associated with the *"parcel"* (516 in FIG. 12) to identify each *"rectangular sub-area"* (307(0)-308(7) in FIG. 11) formed of the *"rectangular area"* (300 in FIG. 11) associated with the *"parcel"* (516 in FIG. 12) that intersects the *"search area"* (400 in FIG. 11). Then, Appellant's

Claim 25 calls for *"using a second index"* (320 in FIGS. 10 and 12) associated with the *"parcel"* (516 in FIG. 12) to identify each of the *"data entities"* (seg(1)-seg(n) in FIG. 10) contained therein that represents a *"geographic feature"* (22(1)-22(n) in FIG. 7) that intersects each of the *"sub-areas"* (307(0)-308(7) in FIG. 11). Appellant's Claim 25 states that in the case where the *"search area"* (400 in FIG. 11) intersects more than one *"rectangular sub-area"* ((0), (2), (3), (7) in FIG. 10) and a *"geographic feature"* (22(e) in FIG. 7) represented by a *"single data entity"* (seg(e) in FIG. 10) intersects more than one *"rectangular sub-area"* ((0), (2), (3), (7) in FIG. 10) the *"second index"* (320 in FIG. 12) identifies the *"single data entity"* (seg(e) in FIG. 10).

Appellant's independent Claim 29 relates to a *"computer usable medium"* (540 in FIG. 12) having *"computer readable data structure means"* embodied thereon and used for a *"database for geographic data"* (530 in FIG. 12) comprised of *"data records"* (22 in FIG. 12) that represent *"segments of roads"* (22(1)-22(n) in FIGS. 2, 3, and 7) located in a *"geographic region"* (12 in FIG. 1). According to Appellant's Claim 29, the *"database for geographic data"* (530 in FIG. 12) includes a plurality of *"parcels"* (516 in FIG. 12), each of which contains a separate portion of the *"data records"* (22 in FIG. 12), such that each *"parcel"* (516 in FIG. 12) contains those *"data records"* (22 in FIG. 12) that represent the *"segments of roads"* (22(1)-22(n) in FIGS. 2, 3, and 7) located in a separate one of a *"plurality of areas"* (204 in FIG. 6; 302 in FIG. 7) into which the *"geographic region"* (12 in FIG. 1) is divided. Further according to Appellant's Claim 29, the *"database for geographic data"* (530 in FIG. 12) further comprises a *"plurality of first indexes"* (322 in FIG. 9), each of which is associated with a respective one of the *"plurality of parcels"* (516 in FIG. 12), wherein each *"first index"* (322 in FIG. 9)

defines a plurality of *"sub-areas"* (307(0)-308(7) in FIG. 11) formed of the *"area"* (300 in FIG. 11) associated with the *"parcel"* (516 in FIG. 12) associated therewith (page 31, line 11-page 32, line 4). Further according to Appellant's Claim 29, the *"database for geographic data"* (530 in FIG. 12) includes a *"plurality of second indexes"* (320 in FIGS. 10 and 12), each of which is associated with a respective one of the plurality of *"parcels"* (516 in FIG. 12), wherein each *"second index"* (320 in FIGS. 10 and 12) associates each of the *"data records"* (seg(1)-seg(n) in FIG. 10) in the associated *"parcel"* (516 in FIG. 12) to at least one of the *"plurality of sub-areas"* (307(0)-308(7) in FIG. 11) defined by the *"first index"* (322 in FIG. 9) associated with the *"parcel"* (516 in FIG. 12). The *"database for geographic data"* according to Appellant's Claim 29 allows a *"geographic feature"* (22(e) in FIG. 7) represented by a *"single data entity"* (seg(e) in FIG. 10) that intersects more than one of the *"rectangular sub-area"* ((0), (2), (3), (7) in FIG. 10) to be identified by the *"second index"* (320 in FIG. 12).

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

At issue is whether Appellant's Claims 13-15 are obvious over the combination of U.S. Pat. No. 5,754,846 ("Janse"), U.S. Pat. No. 5,694,534 ("White Jr."), U.S. Pat. No. 6,282,489 ("Bellesfield"), and U.S. Pat. No. 5,968,109 ("Israni").

At issue is whether Appellant's Claims 20 and 29 are obvious over the combination of Israni and White Jr.

At issue is whether Appellant's Claim 24 is obvious over the combination of Bellesfield, Janse and White Jr.

At issue is whether Appellant's Claim 25 is obvious over the combination of Janse, White Jr. and Bellesfield.

(vii) ARGUMENT

A. Claim 24

In the final Office Action, Appellant's independent Claim 24 was rejected as obvious over the combination of U.S. Pat. No. 6,282,489 ("Bellesfield"), U.S. Pat. No. 5,754,846 ("Janse") and U.S. Pat. No. 5,694,534 ("White Jr."). Appellant's independent Claim 24 is not obvious over this combination of references because all the limitations of this claim are not disclosed or suggested by these references, even if they are combined.

1. Subject matter of Appellant's independent Claim 24

Appellant's independent Claim 24 relates to a method of using a *"geographic database"* to determine the *"data entities"* that represent *"geographic features"* located within a specified *"search area."* The method of Claim 24 uses a *"geographic database"* that has been organized into *"parcels of data"* based on a division of the represented geographic region into *"rectangular areas."* The method of Claim 24 first identifies a *"parcel of data"* in the *"geographic database"* that contains the *"data entities"* that represent those *"geographic features"* located within a *"first rectangular area"* that *"intersects"* the specified *"search area."* Then, the method uses a *"first index"* and a *"second index"* *"associated with the parcel."* The *"first index"* is used to identify which *"rectangular sub-areas"* of the *"first rectangular area"* are intersected by the *"search area"* and the *"second index"* is used to identify the *"data entities"* in the

"parcel" that represent *"geographic features"* that intersect the *"rectangular sub-areas"* identified by the *"first index."*

2. The applied prior art references

a. Bellesfield

Bellesfield discloses a computer-based travel planning system that uses three different types of databases. According to Bellesfield, one database (labeled "26" in FIG. 2 of Bellesfield) includes bit-mapped images of geographic regions, a second database (labeled "30" in FIG. 2 of Bellesfield) includes node and link data used for calculating routes, and a third database (labeled "34" in FIG. 2 of Bellesfield) includes data about the locations of points of interest (*See*, Bellesfield: column 3, lines 25-33). According to Bellesfield, after a route has been calculated, a polyline indicating the shape of the route is generated and overlaid on a bit-map image of a map of the corresponding geographic region (Bellesfield: column 9, lines 26-41). Further according to Bellesfield, points of interest located near the displayed route may be listed and displayed (Bellesfield: column 10, line 37-column 11, line 12).

Bellesfield includes no disclosure about any of the three databases being organized into "parcels", or anything similar or equivalent to "parcels." Furthermore, Bellesfield has no disclosure about any "indexes" associated with any of the databases.

b. Janse

Janse relates to a topological database that is divided into discrete parcels, each of which includes the data that represents a separate rectangular section (e.g., labeled "A",

"B", "C" and "D" in FIG. 2 of Janse) of a geographic region (Janse: column 1, lines 8-13; column 5, lines 1-3; FIG. 2). According to Janse, a "0-cell" represents a point, a "1-cell" represents a road segment and a "2-cell" represents an area (Janse: column 5, lines 8-17). According to Janse, when a road physically crosses the boundary between two sections, the road is represented in the database by two separate "1-cells", one in each of the two data parcels that contain data that represent the two sections. The "1-cell" in each section terminates with a "0-cell" that represents a boundary node corresponding to a point on the road at a location corresponding to the section boundary. Each parcel includes a node list that, for boundary nodes, points to the corresponding boundary node in an adjacent section (Janse: column 2, lines 1-12).

Janse has no disclosure about any further subdivision of the sections (e.g., labeled "A", "B", "C" and "D" in FIG. 2, and "E", "F" and "G" in FIGS. 5 and 6 of Janse). Further, Janse has no disclosure about any "indexes" associated with "parcels" or about the structure of indexes, such as what types of data relate to each other.

c. White Jr.

White Jr. relates to a way to represent topological structures, such as geographic areas. Unlike Janse, White Jr. does not divide a geographic region into separate rectangular sections for storage into separate parcels (White Jr.: column 7, lines 56-64). In fact, White Jr. *teaches away* from a database organization that divides a geographic region into smaller rectangular sized areas (White Jr.: column 2, lines 5-29, 45-61). Instead, White Jr., divides a geographic region into "carriers" using the actual topological structures located in the region (*See*, White Jr., column 7, lines 56-64; FIGS. 3, 3A, 3B,

7B). For purposes of searching, White Jr. uses the more significant features to relate to collections of less significant features (White Jr.: column 9, line 66-column 10, line 11).

Even if the "carriers" disclosed in White Jr. were taken as corresponding to "parcels", as recited in Appellant's Claim 24, White Jr. has *no* disclosure that the topological areas corresponding to a "carrier" are divided into rectangular sub-areas or that any indexes associated with any of the "carriers" relate any of the represented features to any further rectangular sub-areas.

3. The limitations of Appellant's Claim 24 are not disclosed or suggested by Bellesfield, Janse, and White Jr.

As stated above, Appellant's independent Claim 24 is not obvious over the combination of Bellesfield, Janse and White Jr. because all the limitations of Claim 24 are not disclosed or suggested by these references, even if they were combined. Specifically, Bellesfield, Janse and White Jr., even if combined, fail to disclose at least *"first"* and *"second indexes"* associated with a *"parcel of data"* that contains *"data entities that represent geographic features encompassed within a first rectangular area located within the geographic region"*, wherein the *"first index"* is used to identify the *"rectangular sub-areas"* into which the *"first rectangular area is divided"* and the *"second index"* is used to identify the *"data entities"* that represent the geographic features that intersect each of the *"sub-areas" "such that in the case that the search area intersects more than one of said plurality of rectangular sub-areas and a geographic feature represented by a single data entity intersects each of said more than one of said plurality of rectangular sub-areas, the second index identifies said single data entity."*

As explained above, Janse is the *only one* of the three applied references that discloses a geographic database organized into parcels of data based on a rectangular division of the represented geographic region. Bellesfield has no disclosure at all about organization of a geographic database and White Jr. teaches organizing a topological (e.g., geographic) database based on the actual shapes of the represented topological features instead of a rectangular division of the represented region. Further, none of these applied references has any disclosure about any *"indexes"* or similar data structures that could be applied to, or otherwise associated with, a *"parcel of data"* that forms part of a geographic database. Thus, even if the teachings of Bellesfield, Janse and White Jr. were combined, the resultant combination would still fail to disclose at least the following limitations of Appellant's Claim 24:

(i) the *"first index"* associated with a *"parcel of data"* used to identify the *"rectangular sub-areas"* into which the *"first rectangular area"* (i.e., the *"area"* represented by the *"parcel"*) *is divided"*; or

(ii) the *"second index"* associated with a *"parcel of data"* used to identify the *"data entities"* that represent the geographic features that intersect each of the identified *"sub-areas."*

Because the above identified limitations are neither disclosed nor suggested by the combination of Bellesfield, Janse, and White Jr., Appellant's Claim 24 is not obvious over these references. Accordingly, the rejection of Appellant's Claim 24 over this combination of references should be reversed.

B. Claim 25

1. Subject matter of Appellant's independent Claim 25

Appellant's independent Claim 25 relates to a method of using a *"geographic database"* to determine the *"geographic features"* located within a specified *"search area."* The *"geographic database"* used in the method of Appellant's Claim 25 is *"organized into parcels, each of which contains a subset of all the data entities"* and the *"data entities in each parcel represent the geographic features encompassed within a separate respective one of a plurality of rectangular areas into which the geographic region is divided."* The method of Appellant's Claim 25 first identifies the *"parcel"* whose *"rectangular area"* intersects the specified *"search area."* Then, the method of Appellant's Claim 25 uses *"first"* and *"second"* *"indexes associated with"* the *"identified parcel."* According to Appellant's Claim 25, the *"first index"* is used to identify each of the *"rectangular sub-areas"* into which the *"rectangular area"* associated with the *"parcel"* is divided that is intersected by the *"search area"* and the *"second index"* is used to identify the *"data entities"* in the *"parcel"* that represent *"geographic features"* that intersect the *"rectangular sub-areas"* identified by using the *"first index."*

2. The applied prior art references

In the final Office Action, Appellant's Claim 25 was rejected as obvious over the combination of U.S. Pat. No. 5,754,846 ("Janse"), U.S. Pat. No. 5,694,534 ("White Jr.") and U.S. Pat. No. 6,282,489 ("Bellesfield")[1]. Appellant's independent Claim 25 is not

[1] Even though Claim 25 was rejected as obvious over the same three references as Claim 24, the Examiner made the rejection of Claim 25 separate from the rejection of Claim 24 and applied the references

obvious over these references because all the limitations of this claim are not disclosed or suggested by this combination of references, even if they are combined.

The Janse, White Jr., and Bellesfield references were described above in connection with Appellant's Claim 24. Accordingly, the descriptions of these references are not repeated here.

3. The limitations of Appellant's Claim 25 are not disclosed or suggested by Janse, White Jr. and Bellesfield.

As stated above, Appellant's independent Claim 25 is not obvious over the combination of Janse, White Jr. and Bellesfield because all the limitations of the claim are not disclosed or suggested by these references, even if they were combined. Even if the teachings of Janse, White Jr. and Bellesfield were combined, the resultant combination would still fail to disclose at least the following limitations of Appellant's Claim 25:

(i) a *"first index"* associated with a *"parcel"* used to identify each *"rectangular sub-area"* into which the *"rectangular area"* (i.e., the *"area"* represented by the *"parcel"*) *"is divided"*;

(ii) a *"second index"* associated with a *"parcel"* used to identify each of the *"data entities contained"* in the *"parcel"* that represents a *"geographic feature"* that intersects each of the *"rectangular sub-areas"* associated with the *"parcel"*;

(iii) *"using"* the *"first index . . . to identify each rectangular sub-area . . . that intersects"* a *"search area"*; or

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differently. Accordingly, Claim 25 is addressed separately from Claim 24 in this Appeal Brief.

(iv) *"using"* the *"second index to identify each of the data entities . . . that represents a geographic feature that intersects each of the sub-areas . . . that intersects"* the *"search area."*

Because the above identified limitations are neither disclosed nor suggested by the combination of Janse, White Jr. and Bellesfield, Appellant's Claim 25 is not obvious over these references. Accordingly, the rejection of Appellant's Claim 25 over this combination of references should be reversed.

C. Claims 13-15

(In the final Office Action, Appellant's dependent Claims 13-14 were rejected as obvious over the combination of Janse, White Jr., Bellesfield, and Israni. Appellant's Claim 15 distinguishes these references for different reasons than Claims 13 and 14. Therefore in accordance with 37 CFR 41.37(c)(1)(vii), Claim 15 is included below under a separate subheading from Claims 13 and 14 where the separate reasons for the non-obviousness of Claim 15 are presented.)

1. Claims 13 and 14

a. Subject matter of Appellant's Claims 13 and 14

Appellant's Claim 13 depends from independent Claim 25 and states that the *"data entities"* recited in Claim 25 *"represent segments of roads."* Appellant's Claim 14 depends from independent Claim 25 and states that the *"first index is a kd-tree index."*

b. The applied prior art references

The Janse, White Jr., and Bellesfield references were described above in connection with Appellant's independent Claim 24. Accordingly, the descriptions of these references are not repeated here.

The Israni reference discloses a geographic database organized into parcels.[2] Some of the parcels in the Israni database include an internal kd-tree index for performing spatial searches of the data contained in the parcel (Israni: column 43, line 35-colulmn 44, line 24). According to these passages from Israni, the geographic area associated with a cartographic parcel is divided into "cells." When the cartographic parcel is formed, the data entities are grouped by cell, i.e., all the data entities that represent geographic features located within a cell are physically grouped together within the parcel on the medium, separate from the data entities that represent geographic features located within each of the other cells. The internal kd-tree index associated with each cartographic parcel identifies the geographic boundaries of these cells. The internal kd-tree index also identifies where the data entities that represent geographic features located within each cell can be located by identifying the first data entity in each cell and the count of subsequent data entities within the parcel that represent geographic features located within that cell (Israni: FIG. 11B). The arrangement disclosed by these passages from Israni requires that each cell have its own, separate data records for any geographic features located within the cell. As a result, a geographic feature that spans several cells, as shown in FIG. 11C of Israni, is divided up into smaller features (labeled PG11-PG16 in FIG. 11C of Israni). Then, a separate data record is formed for each of the smaller features, each of the separate data records is grouped with other data records that represent features located in their respective cells and then the records for each cell are stored contiguously together within the parcel.

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[2] The Israni patent is assigned to Appellant, NAVTEQ North America, LLC. To the extent permitted by law, any statements in the present brief regarding the disclosure of the Israni patent should not be used to restrict the scope of claims in the Israni patent.

c. The limitations of Appellant's Claims 13 and 14 are not disclosed or suggested by Janse, White Jr., Bellesfield and Israni.

Appellant explained above in connection with independent Claim 25 that the combination of Janse, White Jr. and Bellesfield failed to disclose all the limitations of that claim. Israni discloses several of the limitations that the combination of Janse, White Jr. and Bellesfield failed to disclose. Nevertheless, even if Israni were combined with Janse, White Jr. and Bellesfield, the result would still fail to disclose all the limitations of the Appellant's independent Claim 25 or dependent Claims 13 and 14.

The database organization disclosed in the above-cited passages from the Israni patent addresses the concerns associated with accessing particular data records within a parcel. However, Appellant's independent Claim 25 and dependent Claims 13 and 14 describe a database structure that is different from the database structure disclosed in Israni. In the *"geographic database"* recited in Appellant's independent Claim 25, the *"rectangular area"* associated with a *"parcel"* is divided into *"rectangular sub-areas"*, similar to the "cells" disclosed by Israni. However, unlike the database in Israni, the *"data entities"* contained within each *"parcel"* in the *"geographic database"* described by Appellant's Claim 25 can represent features that are *not limited* to being located within only one *"rectangular sub-area."* Instead, in the *"geographic database"* of Appellant's Claim 25, a *"data entity"* may represent a *"geographic feature"* located in several *"rectangular sub-areas"* associated with a *"parcel."* In order to provide this feature, each *"parcel"* in the *"geographic database"* of Appellant's Claim 25 includes both a *"first index"* and a *"second index."* The *"first index"* is used to identify the boundaries of the *"rectangular sub-areas"* into which the *"rectangular area"* associated

with the *"parcel"* is divided and the *"second index"* is used to identify each *"data entity"* that represents a *"geographic feature"* located in each *"rectangular sub-area"*, where a *"data entity"* may represent a *"geographic feature"* located in more than one *"rectangular sub-area."* This distinguishes the geographic database disclosed in Israni which includes a single index associated with a parcel to find a "data entity" that can represent a geographic feature located in only a single "cell."

Referring back to Janse, White Jr. and Bellesfield, these references are devoid of any teaching or disclosure that would lead one of ordinary skill in the art to modify Israni to include, for each *"parcel"*, a *"second index"* used to identify each of the *"data entities contained"* in that *"parcel"* that represents a *"geographic feature"* that intersects each of the *"rectangular sub-areas"* associated with the *"parcel."* Accordingly, for at least this reason, Appellant's dependent Claims 13 and 14 are not obvious over this combination of references and Appellant requests that the rejection of Claims 13 and 14 be reversed.

2. Claims 15.

a. Subject matter of Appellant's Claim 15

Appellant's Claim 15 depends from independent base Claim 25 and states that the *"second index is a bitmap."*

b. The applied prior art references

Janse, White Jr., and Bellesfield are described above in connection with Appellant's independent Claim 24. Israni is described above in connection with

Appellant's dependent Claims 13 and 14. Accordingly, the descriptions of these references are not repeated here.

c. The limitations of Appellant's Claim 15 are not disclosed or suggested by Janse, White Jr., Bellesfield and Israni.

Appellant explained above in connection with dependent Claims 13 and 14 that the combination of Janse, White Jr., Bellesfield and Israni failed to disclose all the limitations of base Claim 25, as well as dependent Claims 13 and 14. Specifically, Janse, White Jr., Bellesfield and Israni fail to disclose or suggest a *"geographic database"* organized into *"parcels"* based on a division of a represented region into *"rectangular areas"* and that includes, for each *"parcel"*, a *"second index"* used to identify each of the *"data entities contained"* in that *"parcel"* that represents a *"geographic feature"* that intersects each of the *"rectangular sub-areas"* associated with the *"parcel."*

Appellant's dependent Claim 15 is not obvious over the combination of Janse, White Jr., Bellesfield and Israni for this same reason, i.e., the references fail to disclose or suggest the missing limitation of the *"second index associated with each parcel"* used to identify each of the *"data entities contained"* in that *"parcel"* that represents a *"geographic feature"* that intersects each of the *"rectangular sub-areas"* associated with the *"parcel."* In addition to this reason, Appellant's Claim 15 is not obvious over this combination of references for another reason. Specifically, Appellant's Claim 15 is not obvious over this combination of references because these references, even if combined, fail to disclose or suggest that the *"second index"* could be implemented as a *"bitmap."* Accordingly, for either of these reasons, Appellant's Claim 15 is not obvious over the

combination of Janse, White Jr., Bellesfield and Israni. Appellant requests that the rejection of Claim 15 be reversed.

D. Claims 20 and 29

1. Subject matter of Appellant's Claims 20 and 29

Appellant's Claim 29 is an independent claim and Appellant's Claim 20 is a dependent claim that depends from Claim 29.

Appellant's independent Claim 29 relates to a *"computer readable data structure means"* for a *"database for geographic data."* The *"computer readable data structure means"* is comprised of *"a plurality of parcels"* each of which contains a *"separate portion"* of the *"data records that represent segments of roads located in a geographic region"* such that *"each parcel contains the data records that represent the segments of roads located in a separate one of a plurality of areas into which the geographic region is divided."* Claim 29 further recites that the *"computer readable data structure means"* includes a *"plurality of first indexes"*, each of which is associated with a *"respective one of the plurality of parcels"* and a *"plurality of second indexes"*, each of which is also associated with a *"respective one of the plurality of parcels."* According to Claim 29, each *"first index"* defines a *"plurality of sub-areas formed of the area"* associated with the associated *"parcel"* and each *"second index"* associates each of the *"data records"* in the associated *"parcel"* to *"at least one of the plurality of sub-areas defined by the first index associated with the parcel."*

Appellant's dependent Claim 20 states that the *"data records"* associated with each *"sub-area"*, described in Claim 29, are *"approximately similar in number to each other."*

2. The applied prior art references

In the final Office Action, Appellant's Claims 20 and 29 were rejected as obvious over the combination of Israni and White Jr. Israni is described above in connection with Appellant's dependent Claims 13 and 14. White Jr. is described above in connection with Appellant's independent Claim 24. Accordingly, the descriptions of these references are not repeated here.

3. The limitations of Appellant's Claims 20 and 29 are not disclosed or suggested by Israni and White Jr.

The reasons why Appellant's independent Claim 29 is not obvious over the combination of Israni and White Jr. are similar to the reasons explained above in connection with Appellant's dependent Claims 13 and 14, and their base claim, independent Claim 25. Like Appellant's independent Claim 25, Appellant's independent Claim 29 describes a database structure that is different from the database structure disclosed in Israni. In the database recited in Appellant's independent Claim 29, the geographic *"area"* associated with a *"parcel"* is divided into a plurality of *"sub-areas"*, similar to the "cells" disclosed by Israni. However, unlike the database in Israni, the *"data entities"* contained within each *"parcel"* in the *"database"* described by Appellant's Claim 29 can represent features that are *not limited* to being located within only one *"sub-area."* Instead, in the *"database"* of Appellant's Claim 29, a *"data entity"* may represent a *"geographic feature"* located in several *"sub-areas"* associated with a *"parcel."*

The *"database"* of Appellant's Claim 29 can provide this feature because it includes an index data structure associated with each *"parcel"* that is different from the type of index disclosed by Israni. According to Appellant's Claim 29, <u>*two indexes*</u> are associated with each parcel. Each *"first index defines a plurality of sub-areas formed of the area associated with the parcel"* and each *"second index associates each of the data records in the parcel . . . to at least one of the plurality of sub-areas defined by the first index."* With the *"data structure"* of Appellant's Claim 29, a *"geographic feature"* can be located in (i.e., *"intersect"*) more than one of the rectangular *"sub-areas"* formed of the area associated with a *"parcel"* and still be represented by a *"single data entity"*, because the *"second index"* identifies each of the *"sub-areas"* intersected by the *"geographic feature"* represented by the *"single data entity."* Thus, with the *"data structure"* of Appellant's Claim 29, the need to divide up a geographic feature into smaller features, as illustrated in FIG. 11C of Israni, is obviated.

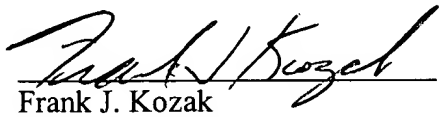
White Jr. is entirely unrelated to the teachings of Israni on this subject. Accordingly, Appellant's independent Claim 29 is not obvious over the combination of Israni and White Jr. and therefore Appellant requests that the rejection of Appellant's independent Claim 29 and dependent Claim 20 be reversed.

ARGUMENT SUMMARY AND CONCLUSION

Appellant's claims relate to an improvement for a database that contains data that represent geographic features. In the final <u>Office Action</u>, the Examiner concluded that Claims 13-15, 20, 24, 25 and 29 were obvious over different combinations of Israni,

White Jr., Janse and Bellesfield. As explained above, none of these references discloses or suggests, alone or in proper combination, all the limitations of any one of these claims. Accordingly, Appellant respectfully requests that the rejections of Claims 13-15, 20, 24, 25 and 29 be reversed.

Respectfully submitted,



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(viii) CLAIMS APPENDIX

13. The method of Claim 25 wherein said data entities represent segments of roads.

14. The method of Claim 25 wherein the first index is a kd-tree index.

15. The method of Claim 25 wherein the second index is a bitmap.

20. The invention of Claim 29 wherein the data records associated with each sub-area are approximately similar in number to each other.

24. A computer-implemented method of using a geographic database comprising the steps of:

accepting specification of a search area in a geographic region represented by the geographic database;

identifying a parcel of data in the geographic database, wherein the parcel contains data entities that represent geographic features encompassed within a first rectangular area located within the geographic region, wherein the first rectangular area intersects said search area;

wherein an improvement comprises:

using a first index associated with the parcel to identify which of a plurality of rectangular sub-areas into which the first rectangular area is divided intersect the search area; and

using a second index associated with the parcel to identify the data entities contained in the parcel that represent geographic features that intersect each of the plurality of rectangular sub-areas identified as intersecting the search area,

such that in the case that the search area intersects more than one of said plurality of rectangular sub-areas and a geographic feature represented by a single data entity intersects each of said more than one of said plurality of rectangular sub-areas, the second index identifies said single data entity,

whereby the data entities that represent the geographic features located within the search area are determined.

25. A computer-implemented method of using a geographic database to identify geographic features located within a search area, wherein the geographic database contains data entities that represent geographic features located in a geographic region, and wherein the geographic database is organized into parcels, each of which contains a subset of all the data entities in the geographic database, and wherein the subset of data entities in each parcel represent the geographic features encompassed within a separate respective one of a plurality of rectangular areas into which the geographic region is divided, wherein the method comprises the steps of:

(a) identifying each parcel that is associated with a rectangular area that intersects the search area;

wherein an improvement comprises:

(b) for each parcel identified in step (a), using a first index associated with the parcel to identify each rectangular sub-area formed of the rectangular area associated with the parcel that intersects the search area; and

(c) for each parcel identified in step (a), using a second index associated with the parcel to identify each of the data entities contained therein that represents a geographic feature that intersects each of the sub-areas identified in step (b),

such that in the case that the search area intersects more than one of said plurality of rectangular sub-areas and a geographic feature represented by a single data entity intersects each of said more than one of said plurality of rectangular sub-areas, the second index identifies said single data entity,

whereby the data entities identified in step (c) represent geographic features located in the search area.

29. A computer usable medium having computer readable data structure means embodied thereon, wherein the computer readable data structure means is used for a database for geographic data comprised of data records that represent segments of roads located in a geographic region, said computer readable data structure comprising:

a plurality of parcels, each of which contains a separate portion of the data records, such that each parcel contains the data records that represent the segments of roads located in a separate one of a plurality of areas into which the geographic region is divided;

wherein an improvement comprises:

a plurality of first indexes, each of which is associated with a respective one of the plurality of parcels, wherein each first index defines a plurality of sub-areas formed of the area associated with the parcel associated therewith; and

a plurality of second indexes, each of which is associated with a respective one of the plurality of parcels, wherein each second index associates each of the data records in the parcel associated therewith to at least one of the plurality of sub-areas defined by the first index associated with the parcel,

wherein in the case where a geographic feature represented by a single data entity intersects more than one of said plurality of rectangular sub-areas, the second index identifies said single data entity,

whereby the computer readable data structure means identifies which of the data records represent segments of roads located in any specified sub-area of any specified area.

(ix) EVIDENCE APPENDIX

There is no evidence of the type indicated in 37 CFR 41.37(c)(1)(ix) to include.

(x) RELATED PROCEEDINGS APPENDIX

There are no related proceedings.